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Sequence Listing was accepted.

See attached Validation Report.

If you need help call the Patent Electronic Business Center at (866)  
217-9197 (toll free).

Reviewer: markspencer

Timestamp: [year=2008; month=11; day=24; hr=9; min=50; sec=12; ms=584; ]

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Application No: 10650591 Version No: 1.0

**Input Set:**

**Output Set:**

**Started:** 2008-10-31 15:32:08.643  
**Finished:** 2008-10-31 15:32:11.651  
**Elapsed:** 0 hr(s) 0 min(s) 3 sec(s) 8 ms  
**Total Warnings:** 44  
**Total Errors:** 4  
**No. of SeqIDs Defined:** 45  
**Actual SeqID Count:** 45

Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (1)
W 213	Artificial or Unknown found in <213> in SEQ ID (2)
W 213	Artificial or Unknown found in <213> in SEQ ID (3)
W 213	Artificial or Unknown found in <213> in SEQ ID (4)
W 213	Artificial or Unknown found in <213> in SEQ ID (5)
W 213	Artificial or Unknown found in <213> in SEQ ID (6)
W 213	Artificial or Unknown found in <213> in SEQ ID (7)
W 213	Artificial or Unknown found in <213> in SEQ ID (8)
W 213	Artificial or Unknown found in <213> in SEQ ID (9)
E 257	Invalid sequence data feature in <221> in SEQ ID (9)
W 213	Artificial or Unknown found in <213> in SEQ ID (10)
W 402	Undefined organism found in <213> in SEQ ID (11)
W 213	Artificial or Unknown found in <213> in SEQ ID (12)
W 213	Artificial or Unknown found in <213> in SEQ ID (13)
W 213	Artificial or Unknown found in <213> in SEQ ID (14)
E 257	Invalid sequence data feature in <221> in SEQ ID (14)
E 257	Invalid sequence data feature in <221> in SEQ ID (14)
W 213	Artificial or Unknown found in <213> in SEQ ID (15)
W 213	Artificial or Unknown found in <213> in SEQ ID (16)
E 257	Invalid sequence data feature in <221> in SEQ ID (16)

**Input Set:**

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**Total Warnings:** 44  
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Error code	Error Description
W 213	Artificial or Unknown found in <213> in SEQ ID (17)
W 213	Artificial or Unknown found in <213> in SEQ ID (19)
W 213	Artificial or Unknown found in <213> in SEQ ID (20)
W 213	Artificial or Unknown found in <213> in SEQ ID (21)
W 213	Artificial or Unknown found in <213> in SEQ ID (22) This error has occurred more than 20 times, will not be displayed

SEQUENCE LISTING

<110> AFEYAN, NOUBAR B.

LEE, FRANK D.

WONG, GORDON G.

DAS GUPTA, RUCHIR A

BAYNES, BRIAN

<120> ADZYMES AND USES THEREOF

<130> COTH-P02-001

<140> 10650591

<141> 2008-10-31

<150> 60/406,517

<151> 2002-08-27

<150> 60/423,754

<151> 2002-11-05

<150> 60/430,001

<151> 2002-11-27

<160> 45

<170> PatentIn version 3.5

<210> 1

<211> 12

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 1

Glu Glu Thr Ala Arg Phe Gln Pro Gly Tyr Arg Ser

1 5 10

<210> 2

<211> 10

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 2

Glu Gln Lys Leu Ile Ser Glu Glu Asp Leu

1 5 10

<210> 3  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 3  
Asp Tyr Lys Asp Asp Asp Lys  
1 5

<210> 4  
<211> 9  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 4  
Tyr Pro Tyr Asp Val Pro Asp Tyr Ala  
1 5

<210> 5  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 5  
Glu Asp Gln Val Asp Pro Arg Leu Ile Asp Gly Lys  
1 5 10

<210> 6  
<211> 11  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 6  
Tyr Thr Asp Ile Glu Met Asn Arg Leu Gly Lys  
1 5 10

<210> 7

<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 7  
Ser Ser Ser Ser Gly  
1 5

<210> 8  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 8  
Ser Gly Gly Gly Gly  
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<210> 9  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<220>  
<221> MOD\_RES  
<222> (3) .. (4)  
<223> Any amino acid

<400> 9  
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1 5

<210> 10  
<211> 6  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic 6x His tag

<400> 10

His His His His His His  
1 5

<210> 11  
<211> 26  
<212> PRT  
<213> Human immunodeficiency virus 1

<400> 11  
Cys Phe Ile Thr Lys Ala Leu Gly Ile Ser Tyr Gly Arg Lys Lys Arg  
1 5 10 15

Arg Gln Arg Arg Arg Pro Pro Gln Gly Ser  
20 25

<210> 12  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 12  
Cys Met His Ile Glu Ser Leu Asp Ser Tyr Thr Cys  
1 5 10

<210> 13  
<211> 12  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 13  
Cys Met Tyr Ile Glu Ala Leu Asp Lys Tyr Ala Cys  
1 5 10

<210> 14  
<211> 32  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<220>

<221> MOD\_RES  
<222> (1)..(1)  
<223> A unique residue, such as cysteine or lysine, that facilitates chemical conjugation of the internalizing peptide to a targeting protein conjugate

<220>  
<221> MOD\_RES  
<222> (2)..(3)  
<223> Any residues selected to modulate the affinity of the internalizing peptide for different membranes

<220>  
<223> see specification as filed for detailed description of substitutions and preferred embodiments

<400> 14  
Xaa Xaa Xaa Glu Ala Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Ala  
1 5 10 15

Glu Ala Leu Ala Glu Ala Leu Ala Glu Ala Leu Glu Ala Leu Ala Ala  
20 25 30

<210> 15  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<400> 15  
Ala Leu Trp His Trp Trp His  
1 5

<210> 16  
<211> 7  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic peptide

<220>  
<221> MOD\_RES  
<222> (1)..(1)  
<223> Thr or Ser

<400> 16  
Xaa Trp Leu His Trp Trp Ala  
1 5

<210> 17  
<211> 5  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 17  
Gly Gly Gly Gly Ser  
1 5

<210> 18  
<211> 6  
<212> PRT  
<213> Influenza A virus

<400> 18  
Asp Val Pro Asp Tyr Ala  
1 5

<210> 19  
<211> 15  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 19  
Gly Gly Gly Gly Ser Gly Gly Gly Ser Gly Gly Gly Ser  
1 5 10 15

<210> 20  
<211> 4  
<212> PRT  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
peptide

<400> 20  
Gly Gly Val Arg  
1

<210> 21  
<211> 639  
<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 21

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser  
20 25 30

Leu Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr  
35 40 45

Phe Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys  
50 55 60

Lys Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile  
65 70 75 80

Asp Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro  
85 90 95

Trp Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly  
100 105 110

Ala Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu  
115 120 125

Leu Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val  
130 135 140

Arg Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys  
145 150 155 160

Ile Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg  
165 170 175

Glu Asn Leu Asp Arg Asp Ile Ala Leu Met Lys Leu Lys Lys Pro Val  
180 185 190

Ala Phe Ser Asp Tyr Ile His Pro Val Cys Leu Pro Asp Arg Glu Thr  
195 200 205

Ala Ala Ser Leu Leu Gln Ala Gly Tyr Lys Gly Arg Val Thr Gly Trp  
210 215 220

Gly Asn Leu Lys Glu Thr Trp Thr Ala Asn Val Gly Lys Gly Gln Pro  
225 230 235 240

Ser Val Leu Gln Val Val Asn Leu Pro Ile Val Glu Arg Pro Val Cys  
245 250 255

Lys Asp Ser Thr Arg Ile Arg Ile Thr Asp Asn Met Phe Cys Ala Gly  
260 265 270

Tyr Lys Pro Asp Glu Gly Lys Arg Gly Asp Ala Cys Glu Gly Asp Ser  
275 280 285

Gly Gly Pro Phe Val Met Lys Ser Pro Phe Asn Asn Arg Trp Tyr Gln  
290 295 300

Met Gly Ile Val Ser Trp Gly Glu Gly Cys Asp Arg Asp Gly Lys Tyr  
305 310 315 320

Gly Phe Tyr Thr His Val Phe Arg Leu Lys Lys Trp Ile Gln Lys Val  
325 330 335

Ile Asp Gln Phe Gly Glu Gly Gly Ser Gly Gly Gly Ser  
340 345 350

Gly Gly Gly Ser Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp  
355 360 365

Leu Val Lys Pro Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly  
370 375 380

Phe Thr Phe Ser Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp  
385 390 395 400

Lys Arg Leu Glu Trp Val Ala Thr Ile Ser Asn Gly Gly Tyr Thr  
405 410 415

Tyr Tyr Pro Asp Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn  
420 425 430

Ala Lys Asn Thr Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp  
435 440 445

Thr Ala Met Tyr Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly  
450 455 460

Phe Ala Tyr Trp Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly  
465 470 475 480

Gly Gly Ser Gly Gly Ser Gly Gly Gly Ser Asp Ile Val  
485 490 495

Met Ser Gln Ser Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile  
500 505 510

Thr Met Ser Cys Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln  
515 520 525

Lys Asn Tyr Leu Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys  
530 535 540

Leu Leu Ile Tyr Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg  
545 550 555 560

Phe Thr Gly Ser Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser  
565 570 575

Val Lys Ala Glu Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser  
580 585 590

His Pro Leu Thr Phe Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala  
595 600 605

Asp Ala Ala Pro Thr Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser  
610 615 620

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His  
625 630 635

<210> 22

<211> 639

<212> PRT

<213> Artificial Sequence

<220>

<223> Description of Artificial Sequence: Synthetic  
polypeptide

<400> 22

Met Glu Thr Asp Thr Leu Leu Leu Trp Val Leu Leu Leu Trp Val Pro  
1 5 10 15

Gly Ser Thr Gly Asp Ala Ala Gln Pro Ala Arg Arg Ala Val Arg Ser  
20 25 30

Leu Met Glu Val Gln Leu Leu Glu Ser Gly Gly Asp Leu Val Lys Pro  
35 40 45

Gly Gly Ser Leu Lys Leu Ser Cys Ala Ala Ser Gly Phe Thr Phe Ser  
50 55 60

Thr Tyr Gly Met Ser Trp Val Arg Gln Thr Pro Asp Lys Arg Leu Glu  
65 70 75 80

Trp Val Ala Thr Ile Ser Asn Gly Gly Tyr Thr Tyr Tyr Pro Asp  
85 90 95

Ser Val Lys Gly Arg Phe Thr Ile Ser Arg Asp Asn Ala Lys Asn Thr  
100 105 110

Leu Tyr Leu Gln Met Ser Ser Leu Lys Ser Glu Asp Thr Ala Met Tyr  
115 120 125

Tyr Cys Ala Arg Arg Glu Arg Tyr Asp Glu Asn Gly Phe Ala Tyr Trp  
130 135 140

Gly Arg Gly Thr Leu Val Thr Val Ser Ala Gly Gly Gly Ser Gly  
145 150 155 160

Gly Gly Gly Ser Gly Gly Ser Asp Ile Val Met Ser Gln Ser  
165 170 175

Pro Ser Ser Leu Ala Val Ser Val Gly Glu Lys Ile Thr Met Ser Cys  
180 185 190

Lys Ser Ser Gln Ser Leu Phe Asn Ser Gly Lys Gln Lys Asn Tyr Leu  
195 200 205

Thr Trp Tyr Gln Gln Lys Pro Gly Gln Ser Pro Lys Leu Leu Ile Tyr  
210 215 220

Trp Ala Ser Thr Arg Glu Ser Gly Val Pro Asp Arg Phe Thr Gly Ser  
225 230 235 240

Gly Ser Gly Thr Asp Phe Thr Leu Thr Ile Ser Ser Val Lys Ala Glu  
245 250 255

Asp Leu Ala Val Tyr Tyr Cys Gln Asn Asp Tyr Ser His Pro Leu Thr  
260 265 270

Phe Gly Gly Thr Lys Leu Glu Ile Lys Arg Ala Asp Ala Ala Pro  
275 280 285

Thr Gly Gly Gly Ser Gly Gly Ser Gly Gly Gly Ser  
290 295 300

Met Thr Ala Thr Ser Glu Tyr Gln Thr Phe Phe Asn Pro Arg Thr Phe  
305 310 315 320

Gly Ser Gly Glu Ala Asp Cys Gly Leu Arg Pro Leu Phe Glu Lys Lys  
325 330 335

Ser Leu Glu Asp Lys Thr Glu Arg Glu Leu Leu Glu Ser Tyr Ile Asp  
340 345 350

Gly Arg Ile Val Glu Gly Ser Asp Ala Glu Ile Gly Met Ser Pro Trp  
355 360 365

Gln Val Met Leu Phe Arg Lys Ser Pro Gln Glu Leu Leu Cys Gly Ala  
370 375 380

Ser Leu Ile Ser Asp Arg Trp Val Leu Thr Ala Ala His Cys Leu Leu  
385 390 395 400

Tyr Pro Pro Trp Asp Lys Asn Phe Thr Glu Asn Asp Leu Leu Val Arg  
405 410 415

Ile Gly Lys His Ser Arg Thr Arg Tyr Glu Arg Asn Ile Glu Lys Ile  
420 425 430

Ser Met Leu Glu Lys Ile Tyr Ile His Pro Arg Tyr Asn Trp Arg Glu  
435 440 445

Asn Leu Asp Arg Asp Ile Ala Leu Met Lys Leu Lys Lys Pro Val Ala  
450 455 460

Phe Ser Asp Tyr Ile His Pro Val Cys Leu Pro Asp Arg Glu Thr Ala  
465 470 475 480

Ala Ser Leu Leu Gln Ala Gly Tyr Lys Gly Arg Val Thr Gly Trp Gly  
485 490 495

Asn Leu Lys Glu Thr Trp Thr Ala Asn Val Gly Lys Gly Gln Pro Ser  
500 505 510

Val Leu Gln Val Val Asn Leu Pro Ile Val Glu Arg Pro Val Cys Lys  
515 520 525

Asp Ser Thr Arg Ile Arg Ile Thr Asp Asn Met Phe Cys Ala Gly Tyr  
530 535 540

Lys Pro Asp Glu Gly Lys Arg Gly Asp Ala Cys Glu Gly Asp Ser Gly  
545 550 555 560

Gly Pro Phe Val Met Lys Ser Pro Phe Asn Asn Arg Trp Tyr Gln Met  
565 570 575

Gly Ile Val Ser Trp Gly Glu Gly Cys Asp Arg Asp Gly Lys Tyr Gly  
580 585 590

Phe Tyr Thr His Val Phe Arg Leu Lys Lys Trp Ile Gln Lys Val Ile  
595 600 605

Asp Gln Phe Gly Glu Ala Arg Gly Gly Pro Glu Gln Lys Leu Ile Ser  
610 615 620

Glu Glu Asp Leu Asn Ser Ala Val Asp His His His His His His  
625 630 635

<210> 23

<211> 30

<212> DNA

<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 23  
cccggaagct taatggaggt gcagctgttg

30

<210> 24  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 24  
acgccccctcg agcagttggc gcagcatcag c

31

<210> 25  
<211> 33  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 25  
cccggaagct taatgaccgc caccagttag tac

33

<210> 26  
<211> 31  
<212> DNA  
<213> Artificial Sequence

<220>  
<223> Description of Artificial Sequence: Synthetic  
oligonucleotide

<400> 26  
ggccccctcga gcctctccaa actgatcaat g

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<210> 27  
<211> 72  
<212> DNA  
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<220>  
<223> Description of Ar